

Abstract

A laser source is provided for generating amplified and filtered optical output having high optical power with high spectral fidelity, the laser source comprising a VCSEL  
5 configured to generate seed light having a given spectral wavelength; a power optical amplifier configured to receive the seed light generated by the VCSEL and amplify the seed light so as to generate amplified optical output having a given output power; and a filter configured to receive the  
10 amplified optical output from the power amplifier and reduce background ASE from the power optical amplifier so as to generate the amplified and filtered optical output having high optical power with high spectral fidelity. A laser source is provided for generating amplified and filtered  
15 optical output having high optical power and having high spectral fidelity, the laser source comprising a first mirror and a second mirror forming a cavity therebetween; an optical amplifier disposed in the cavity formed between the first mirror and the second mirror, the optical amplifier  
20 configured to generate ASE and amplify the power of the generated ASE between the first mirror and the second mirror; and filter means for filtering the ASE generated and

amplified by the optical amplifier to reduce background noise therefrom so as to generate the amplified and filtered optical output laser having high optical power and high spectral fidelity.

5           A system is provided for generating amplified and filtered optical output having high optical power and high spectral fidelity, the system comprising an optical platform having a set of electrical connections and a fiber optic connection; a VCSEL configured to generate seed light, and  
10       the VCSEL in electrical connection to one of the set of electrical connections of the optical platform; an optical amplifier configured to receive the seed light generated by the VCSEL and amplify the seed light so as to generate power boosted ASE having a given output power, and the optical  
15       amplifier in electrical connection to one of the set of electrical connections of the optical platform; and a filter configured to receive the power boosted ASE from the power amplifier and reduce background noise from the power boosted ASE so as to generate an output ASE having high spectral  
20       fidelity.

          A method of generating optical output having high optical power with high spectral fidelity is provided, the

method comprising generating seed light from a low power source, the seed light having a given output power and a given spectral fidelity; amplifying the seed light source from the given output power to an amplified optical output using a power optical amplifier, the amplified optical output having an adjusted spectral fidelity and an amplified output power, and the amplified output power being greater than the given output power of the seed light; and filtering the amplified optical output produced by the optical amplifier to reduce background noise therein so as to generate the amplified and filtered optical output having high spectral fidelity greater than the adjusted spectral fidelity of the power boosted ASE.